

Skunk Works®



The Future of Air Travel

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Vice President Customer Requirements
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Birth of The Skunk Works® – 17 June 1943



Hall Hibbard and Kelly Johnson

Top Secret XP-80 Design

**The Objective:
Immediate Development and Delivery
of Jet Fighters to Europe to Counter
German Jets Attacking Allied
Bomber Formations**



Skunk Works® – Disruptive Speed / Agility



U-2 8 Months



A-12 / SR-71 32 Months



F-117 31 Months



YF-22 48 Months



X-35 49 Months

Urgent National Needs... Disruptive Designs Delivered Fast

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Aviation Innovation Drivers



- Peers Closing Tech Gap
- Rapidly Expanding & Adapting Military Threats
- Proliferating Commercial Competitors
- Time For Game Change With American Innovation



Renaissance In American Aviation Innovation



Future Fighters



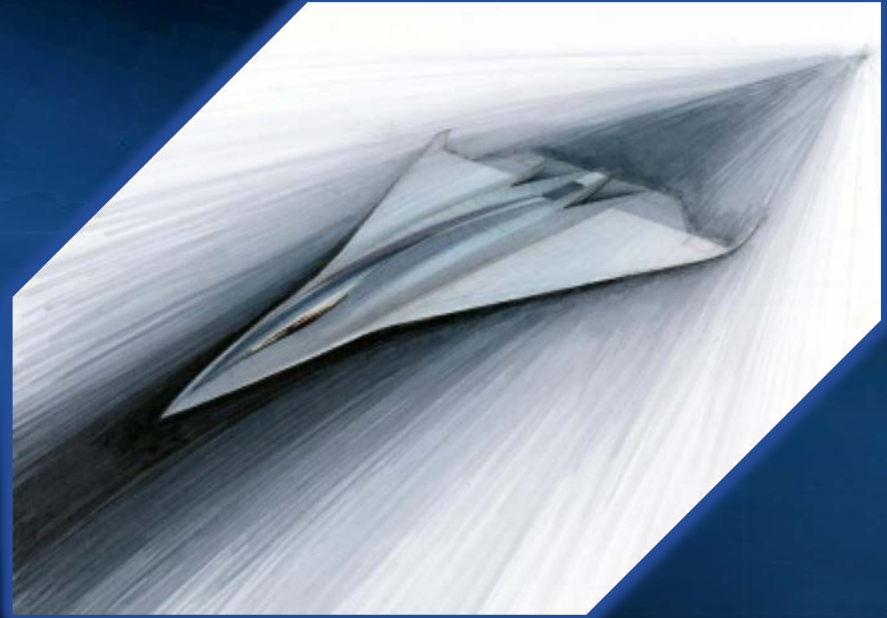
Commercial Aircraft



Unmanned Air Systems

AIRCRAFT FEATURES





NASA STRATEGIC IMPLEMENTATION PLAN



3 Mega-Drivers



6 Strategic Research & Technology Thrusts



Safe, Efficient Growth in Global Operations

- Enable full NextGen and develop technologies to substantially reduce aircraft safety risks



Innovation in Commercial Supersonic Aircraft

- Achieve a low-boom standard



Ultra-Efficient Commercial Vehicles

- Pioneer technologies for big leaps in efficiency and environmental performance



Transition to Low-Carbon Propulsion

- Characterize drop-in alternative fuels and pioneer low-carbon propulsion technology



Real-Time System-Wide Safety Assurance

- Develop an integrated prototype of a real-time safety monitoring and assurance system

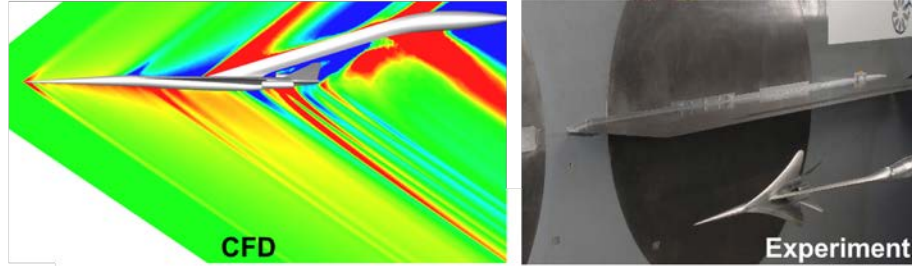


Assured Autonomy for Aviation Transformation

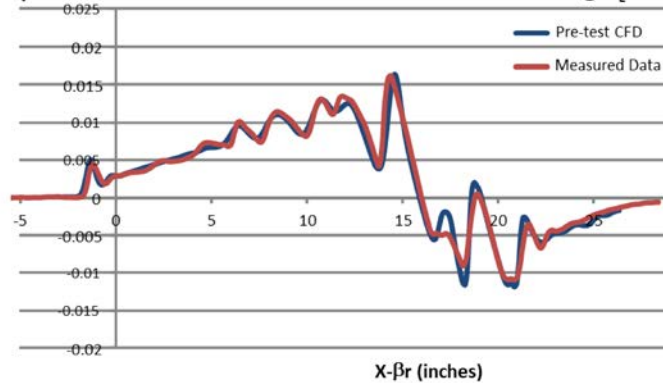
- Develop high impact aviation autonomy applications



X-59: BREAK THROUGH IN BOOM NOISE REDUCTION



Comparison of Pre-test CFD and Wind Tunnel Measurements @ $C_L = 0.142$

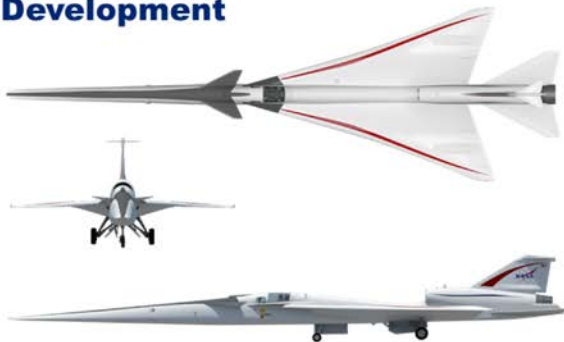


Opens Door To Over-Land Supersonic Flight



Photo Credit: Bridget Caswell, NASA

Development



Performance

- Design Mach 1.4
- Loudness <75 PLdB
- Engine F414-GE-100



- Fuel 8000 lb.
- MTOW 24,300 lb.
- Payload 600 lb.



Focusing on Performance and Execution